6.0 MONITORING EFFECTIVENESS

Monitoring effectiveness is an essential part of implementation of the WMP. Monitoring is based on a series of indicators that describe how the implementation steps will be tracked and evaluated to ultimately measure the success of the WMP.

6.1 IDENTIFYING INDICATORS

An indicator is a fact or datum that can be measured to show rate of change. There are 3 types of indicators: 1) administrative, such as something that can be counted – the number of permits, number of grassed waterways, or policy and ordinances adopted or enforced; 2) environmental, are long-time measurements of water quality of habitat – concentration of phosphorous or nitrogen in water; and 3) social, indicating changes in stakeholder attitudes and behaviors.

Indicators have been identified for each goal and management measure. Section 5 of this WMP discussed the problem, goal, and target for sediment, nutrient, pathogen, and education/outreach. These goals are as follows:

1. Reduce sediment delivery to waterbodies within the Lower Fall Creek Watershed.
2. Reduce excess nutrient loadings to waterbodies within the Lower Fall Creek Watershed.
3. Reduce pathogen loadings to waterbodies within the Lower Fall Creek Watershed.
4. Increase watershed related public education and outreach efforts within the Lower Fall Creek Watershed.

Table 6-1 through **Table 6-4** identifies the administrative, environmental, and social indicators and the tracking process for each of the management measures identified in Section 5. For consistency with Section 5, indicators are identified by sediment, nutrient, pathogen, and education/outreach. The successful implementation of the Lower Fall Creek WMP depends on the participation of a number of responsible/partnering entities (Table 5-1). However, tracking progress of this WMP will be the responsibility of the Marion County SWCD and the Lower Fall Creek Watershed Alliance.

Table 6-1: Sediment Indicators

Management Measure	Indicator	Tracking Process
Educate contractors and developers regarding Rule 5 & Rule 13 requirements, inspections, and enforcement.	Environmental – reduce sediment runoff from construction sites Social – change attitude and behavior of contractors and developers	• Number and type of contractors and developers that participate in training(s)
Stabilize streambanks along Fall Creek with native vegetation (target adjacent publicly owned open spaces and golf courses), removing invasive species if present.	Administrative – number of linear feet of streambank stabilized with natives Environmental – reduce sediment from failing streambanks Social – increase awareness about natives and value for water quality, streambank stabilization	• Feet of streambank where bank stabilized, natives planted, and invasives removed • Volume of invasive species removed, natives added, and materials to stabilize streambank • Number and type of participants
Develop a Lake Management Plan for priority lakes.	Administrative – completed Lake Management Plan Social – through the development of the Plan, change attitudes and behaviors of lake residents	• Completed Lake Management Plan
Reduce soil erosion and stormwater runoff from construction sites.	Administrative – enforce erosion and sediment control ordinances Environmental – reduce sediment runoff from construction sites	• Number of ordinance violations issued • Volume of sediment runoff reduced
Create a Highly Erodible Land (HEL) Overlay Zone for planning & zoning purposes.	Administrative – adoption of a HEL Overlay Zone Environmental – reduce sediment runoff Social – increase awareness of HEL soils and need for protection	• Adopted HEL Overlay Zone
Partner with County SWCD and NRCS to identify lands non eligible for CRP, EQIP, or other federal programs and work with landowners to implement BMPs such as conversion to conservation tillage or	Administrative – Implementation of BMPs Environmental – reduce sediment runoff Social – increase awareness of benefits of conservation tillage or other BMPs	• Number of acres converted, number of acres of filter strips, or number of other BMPs implemented • Volume of sediment runoff

establishment of filter strips		reduced
Establish signage program to identify active construction sites or developers that are in compliance with IDEM's Rule 5 program.	Administrative – implement program Environmental – reduce sediment runoff from construction sites Social – change attitudes and behavior about construction BMPs	• Number of signs installed • Volume of sediment runoff reduced

Table 6-2: Nutrient Indicators

Management Measure	Indicator	Tracking Process
Evaluate Development Ordinances based on the Center for Watershed Protection's "Code & Ordinance Worksheet Tool".	Administrative – amend Development Ordinances Environmental – improved water quality through better land use and site design practices Social – change attitudes and behaviors about land use planning and water quality	• Amended Development Ordinances
Prepare a Wellfield Protection Ordinance for the Madison County WFPA.	Administrative – adopt Wellfield Protection Ordinance Environmental – reduce potential for surface and groundwater pollution by regulating land use Social – change attitudes and behaviors about land use planning and water quality	• Adopted Wellfield Protection Ordinance
Encourage golf courses along Fall Creek and lakes larger than 50 acres to participate in the Audubon Cooperative Sanctuary Program, Groundwater Guardian Green Sites, National Wildlife Federation, or a similar conservation program.	Environmental – reduce nutrient runoff Social – increase awareness among golf course managers and residential property owners about nutrient application	• Number of participants in programs
Integrate Low Impact Development (LID) practices into new or re-development projects.	Administrative – amend Development Ordinances to allow for LID practices Environmental – capture and treat nutrients on-site; reduce runoff to receiving water Social – change attitudes and behaviors among decision-makers, developers, and land owners	• Number of LID techniques installed • Volume of nutrients captured and treated with LID BMPs

Table 6-3: Pathogen Indicators

Management Measure	Indicator	Tracking Process
Establish or enhance shoreline and streambank riparian buffers to reduce potential increases in bacteriological impacts from wildlife and domestic pets throughout the Lower Fall Creek Watershed.	Environmental – reduced pathogens from wildlife and domestic animals Social – change attitudes and behaviors among landowners around lakes and along waterways	• Volume of pathogens reduced
Partner with the Indiana State Fair Board to reduce *E. coli* loadings to Fall Creek.	Environmental – reduce pathogens from State Fairgrounds Social – change attitudes and behaviors of fairground managers	• Volume of pathogens reduced
Partner with County SWCD and NRCS to identify lands non eligible for CRP, EQIP, or other federal programs and work with landowners to implement BMPs such as nutrient management or establishment of filter strips	Administrative – Implementation of BMPs Environmental – reduce pathogen laden runoff Social – increase awareness of benefits of nutrient management or other BMPs	• Number of Nutrient Management Plans developed, or number of other BMPs implemented • Volume of pathogen laden runoff reduced
Support the Septic Tank Elimination Program (STEP) especially within the WFPAs and floodplains of the Lower Fall Creek Watershed.	Administrative – implementation of STEP in WFPA and floodplain Environmental – reduced pathogens from failing septic systems	• Volume of pathogens reduced • Number of septic tanks eliminated in WFPA and floodplain
Provide education and outreach to areas outside of Marion County with anticipated inadequately functioning septic systems or illicit storm sewer connections.	Administrative – Educational materials distributed or provided Environmental – reduced pathogens from failing septic systems or illicit connections Social – increased awareness of septic system maintenance and water quality impacts	• Number of materials provided, homeowners reached

Table 6-4: Education Indicators

Management Measure	Indicator	Tracking Process
Create education demonstration project(s) to illustrate good urban development or redevelopment practices and good stormwater management in critical watershed areas. **Appendix 6** includes a BMP Demonstration Report prepared as part of this WMP.	Administration – BMP Demonstration Report implemented Environmental – reduced sediment, nutrients, and pathogen loads to receiving waters Social – change attitudes and behaviors of landowners installing BMPs and public viewing BMP	• Number of BMP Demonstration projects implemented • Volume of pollutants reduced
Develop future education & outreach programs based on results of the Social Indicators Survey.	Administrative – establish programs based on survey responses Social – change attitudes and behaviors of survey participates	• Number of programs established
Host an annual “Watershed Awareness” or “Celebrate Fall Creek” event (stream clean-up, water quality monitoring, educational workshops, safety, health and wellness).	Social – change attitudes and behaviors of event participants	• Number of participants • Number of workshops • Miles stream clean-up
Evaluate land use planning strategies based on the CWP’s “Managing Stormwater in Your Community”	Administrative – amend Land Use Plans Environmental – improved water quality through better land use and site design practices Social – change attitudes and behaviors about land use planning and water quality	• Number of Land Use Plans amended

6.2 PLAN EVALUATION

The Marion County SWCD in partnership with the Lower Fall Creek Watershed Alliance will be responsible for the regular review and update of this WMP. This plan should be evaluated on a biannual basis to document and celebrate progress; assess effectiveness of efforts; modify activities to better target water quality issues; and keep implementation of the plan on schedule. The plan should be revised as needed to better meet the needs of the watershed stakeholders and to meet water quality goals.